

Appendix F
Hazard Classification

OU 4-13 Transformer Yard
Remedial Action Hazard

1. Project File No.: NA

2. Project/Task: Classification

3. Subtask: Hazard Classification

4. Title: OU 4-13 Transformer Yard Remedial Action Hazard Classification

5. Summary:

The purpose of this Engineering Design File is to document the hazard classification of the OU 4-13 Transformer Yard Remedial Action and to support the determination that the facility can be safely remediated under the administrative control of the health and safety plan.

6. Distribution (complete package):

A. G. Ramos, MS 3960; D. J. Wiggins, MS 3953; M. R. Sharpsten, MS 3458

Distribution (summary package only):

7. Review (R) and Approval (A) Signatures:

(Minimum reviews and approvals are listed. Additional reviews/approvals may be added.)

	R/A	Typed Name/Organization	Signature	Date
Performer	R	T. L. Cook/Safety Analysis	<i>Thomas L. Cook</i>	1/29/01
Independent Reviewer	R	I. E. Stepan/Safety Analysis	<i>I. E. Stepan</i>	1/29/01
Independent Reviewer	R	R. G. Peatross/Safety Analysis	<i>R. G. Peatross</i>	1/29/01
Independent Reviewer	R	M. R. Sharpsten/Facility Hazard Identification Control	<i>Michael R. Sharpsten</i>	1/30/01
Requestor	A	D. J. Wiggins/Project Engineering	<i>Daligzin Wiggins</i>	2/5/01
Approver	A	A. G. Ramos/Safety Analysis Resources	<i>Antonio Ramos</i>	1/29/01

OU 4-13 Transformer Yard Remedial Action Hazard Classification

DISCUSSION

DOE-ID Order ID O 420.D requires that a hazard classification be performed for all facilities and activities to assure that all hazards are identified. This Engineering Design File is to document that a hazard assessment for remedial actions at the Central Facilities Area Transformer Yard, which is adjacent to Building CFA-667, has been performed. The proposed remedial action will consist of removing the upper 12 in. of soil that has been contaminated with lead during 32 years of operation in the yard and CFA-667. Approximately 322 yd³ of lead-contaminated soil will be removed and disposed in the CFA landfill or a commercial treatment, storage, and disposal facility depending on the lead concentrations. Based on historical knowledge of operations at this site, and radiological surveys, there is no evidence of radiological contamination.

Soil samples have indicated the lead contamination levels average 1,848 mg/kg at the soil surface, the highest concentration being 5,560 mg/kg. Subsurface samples yielded values only slightly higher than the INEEL background of 17 mg/kg. The soil surface samples indicate that the average lead concentration in the surface soils is the only concentration that exceeds the EPA residential lead screening level of 400 mg/kg, hence the decision to remove the upper 12 in. of soil. (It should be noted that 40 CFR 302.4 does not identify a reportable quantity for lead but does provide a reportable quantity for various heavy metals if the mean diameter of the particles released is <100 micrometers. In this case, the reportable quantity for lead becomes 10 lb.)

An estimation of the total quantity of lead in the soil of the Transformer Yard is unnecessary due to the form of the material, i.e., particle size ranging from microscopic intimately mixed with the soil up to solid bits and pieces. The larger pieces are not an exposure concern because their size effectively negates personnel exposure through inhalation or ingestion. However, lead-contaminated dust, stirred by machinery or wind, could present an exposure concern to personnel while the remedial activities are in progress.

An estimate of the quantity of material to which a worker could be exposed can be made by:

- assume that all of the soil is contaminated at the highest sample concentration (5,560 mg/kg),
- assume that a dump truck hauls 20 yd³ per load, INEEL soil weighs 90 lb/ft³, and that 50% of the lead contamination is particles <100 micrometers.

Then;

$$20 \text{ yd}^3/\text{load} \times 27 \text{ ft}^3/\text{yd}^3 = 540 \text{ ft}^3 \times 90 \text{ lb/ft}^3 = 48,600 \text{ lb/load}$$

$$48,600 \text{ lb/load} \times .45359 \text{ kg/lb} = 22,044 \text{ kg/load}$$

$$22,044 \text{ kg/load} \times 5.56 \text{ g/kg(soil)} = 122,565 \text{ g/load}$$

$$122,565 \text{ g/load} \times .0022046 \text{ lb/g} = 270.2 \text{ lb/load}$$

$$270.2 \text{ lb/load} \times .5 (<100 \text{ micrometers}) = 135 \text{ lb/load that is } <100 \text{ micrometers}$$

$$135 \text{ lb/load} \times .01 (\text{airborne release fraction}) = 1.35 \text{ lb/load to which a worker could be exposed.}$$

As can be seen, the potentially releasable quantity of lead, per load, is approximately 10% of the reportable quantity specified in 40 CFR 302.4 and would present no undue hazard to personnel during the remediation project.

These factors have been taken into consideration in the health and safety plan in that provisions have been made for site, activity, and personnel monitoring as deemed necessary by the project industrial hygienist. Additionally, action levels have been identified that, if exceeded, will trigger a PPE upgrade and/or require entering the Lead Abatement Program to limit personnel exposure to lead through inhalation or ingestion of contaminated soil particles.

Based on the considerations discussed above, this activity is categorized as "other industrial" and no analyses in addition to those done in the health and safety plan are necessary. This project will be conducted under the administrative control of the *Health and Safety Plan Idaho National Engineering and Environmental Laboratory Central Facilities Area, Operable Unit 4-13 Transformer Yard*, INEEL/EXT-2000-01421, Revision 0, January 2000.

REFERENCES

1. Health and Safety Plan Idaho National Engineering and Environmental Laboratory Central Facilities Area, Operable Unit 4-13 Transformer Yard, INEEL/EXT-2000-01421, Revision 0, January 2000.
2. Code of Federal Regulations, Title 40, Protection of the Environment, Part 302, Designation, Reportable Quantities, and Notification.
3. DOE-ID O 420.D, *Requirements and Guidance for Safety Analysis*, U. S. Department of Energy, Idaho Operations Office, July 2000.
4. MCP-2451, *Safety Analysis for Other Than Nuclear Facilities*, current revision.
5. MCP-2720, *Controlling and Monitoring Exposures to Lead*, current revision.